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BIOLOGICAL BRANCH - DIVISION OF SCIENCE SERVICES.

PLANT DISEASE SURVEY

for the

TWELVE MONTH PERIOD ENDING 30TH JUNE, 1947.

SEVENTEENTH ANNUAL REPORT.

Notes compiled by officers of the Plant Pathological Section of the Biological Branch, New South Wales Department of Agriculture.

ACKNOWLEDGMENTS. Grateful acknowledgment is made of data provided by the Colonial Sugar Refining Company Ltd. in respect of diseases of sugar cane; also information made available by the Specialist and Field Officers of the Divisions of Horticulture and Plant Industry in the Department of Agriculture, and by members of the Faculty of Agriculture, University of Sydney.

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DEPARTMENT OF AGRICULTURE.

NEW SOUTH WALES.

BIOLOGICAL BRANCH - DIVISION OF SCIENCE SERVICES.

PLANT DISEASE SURVEY - 1946/47.

Seventeenth Annual Report.

WEATHER CONDITIONS.

In the northern half of the State, the 1946/47 season began with severe drought accompanied, in most areas, by heavy frosts. These conditions continued throughout the winter, but splendid rains set in in mid-September over all the northern portion of N.S.W. and thus ended a six month's drought period in that area.

In southern districts, soil moisture was from fair to satisfactory from June onwards, but the September falls were generally below average. Frosts were particularly heavy in this area. The Central Coast experienced a record period of 33 days without rain in July-August, followed by a further record of 19 consecutive rainless days in June 1947.

Hot dry winds were experienced generally in late spring and early summer, while from January to May, the Middle and Far North Coast was subjected to almost continuous rain.

Autumn temperatures 1947 were milder than usual throughout the State.

CEREALS AND GRASSES.

WHEAT:

The 1946/47 wheat yield was one of the lowest on record. Statewide drought or semi-drought conditions prevailed during the growing period of the crop and in only a few favoured areas were satisfactory yields obtained. The incidence of disease was low, generally, and no outbreak of epiphytotic proportions was recorded in the State.

STEM RUST (Puccinia graminis tritici) did not develop to any serious extent except in irrigated crops in Southern Riverina, where many crops showed from 10 to 30% infection. However, in the majority of instances, rust did not develop until very late in the season and yields were not seriously reduced. Elsewhere in the wheat belt the degree of rust infection was very slight.

FROST INJURY: Frost attack caused more serious damage to wheat crops during the season than did any disease of fungal or bacterial origin. It was particularly severe in south-western districts where a series of severe frosts occurred towards the end of August. Blighting of the heads and leaf tips, rupturing of the lower stem nodes and a brownish discolouration of the basal portion of stems and internal stem tissues were commonly observed.

The degree of injury varied from 5% to at least 80% in some instances.

FLAG SMUT (Urocystis tritici) was reported in only one instance. This was in a crop of the variety Gular in Southern Riverina. The low incidence of this disease may be attributed primarily to late sowings and an increase in the proportion of resistant varieties cultivated.

LEAF RUST (Puccinia triticina) was observed in Southern Riverina and on the South-Western Slopes. It was also reported from the northern portion of the wheat belt. Damage was of minor importance.

LOOSE SMUT (Ustilago tritici) was the most widespread of all diseases of wheat this season. It was reported from northern and southern N.S.W. and from the central wheat belt. The most seriously affected crops were in the Wagga, Albury, Finley and Deniliquin districts in the southern portion of the State. The varieties Mitchell and Ranee frequently showed a moderate to high degree of infection. Varieties infected to a lesser degree included Ford, Charter, Barcota Wonder, Dundee, Ghurka, Quadrat and Eureka.

TAKE-ALL (Ophiobolus graminis) was reported only from the Riverina. In the majority of instances damage caused was of minor importance. However, crops showing 25% losses were reported from Boree Creek and Sandigo.

BUNT (Tilletia caries and T. foetida) was not as widespread as the previous season. The disease was reported only from Central-Western districts and the Riverina. Infection was slight in all instances.

LEAF SPOT or WINTER BLIGHT (Septoria tritici) was prevalent in many of the southern wheat districts, but caused little serious damage. However, in the Finley-Berrigan-Deniliquin area, Septoria infection was considered to be responsible for a certain amount of grain "pinching". Although observed in Northern districts, the disease was not as widespread as in the South and South-west of the State.

BLACK CHAFF (Xanthomonas translucens var. undulosa) was more in evidence than last season. It was observed throughout the wheat belt but was most prominent on the Northern Tablelands and North-Western Slopes. Late sown experimental plots at Glen Innes were severely infected.

POWDERY MILDEW (Erysiphe graminis) was not reported from the wheat belt proper. Occasional crops, grown for fodder purposes on the coast and in the Metropolitan Area, showed light to moderate infection.

LEAF FRILL (non-parasitic) was reported from Temora and Griffith. This condition is believed to result from insect puncture, probably by aphids, in the early stages of leaf growth.

SEEDLING BLIGHT (Fusarium culmorum) was observed at four localities on the Central Western Slopes. The pathogenic activity of the organism was apparently favoured by warm autumn weather. The seed was sown in a warm, moist seed-bed and germination was good However, seedling blight and pre-emergence damping-off reduced effective germination by 20-25%. Outbreaks also occurred on the Murrumbidgee Irrigation Areas.

EELWORM DISEASE (Heterodera schachtii) of CEREALS. An area of approximately 2,000 square miles was surveyed during the season for evidence of the EELWORM DISEASE of cereals, which is troublesome in South Australia and the Wimmera district of Victoria. No evidence of the disease was observed during the course of the survey, which involved an examination of 98 cereal crops at 25 different localities in the Riverina and the South Western Slopes.

OATS:

FROST INJURY caused more damage to oat crops during the season than did any disease of fungal or bacterial origin. Frosts were experienced over a wide area but the most severe damage was caused in Southern and South-Western districts. Late frosts were responsible for severe tip frosting of panicles in early crops, particularly in the areas surrounding Narrandera, Coolamon and Wagga. In many crops 70-90% of the panicles were affected. Leaf damage was considerable in late sown crops.

LOOSE SMUT (Ustilago avenae) and COVERED SMUT (U.kolleri) were serious only on the Northern Tablelands, where the variety White Tartarian, was frequently heavily infected. The disease was not reported from Southern districts.

STEM RUST (Puccinia graminis avenae) and CROWN or LEAF RUST (Puccinia coronata) were prevalent in coastal areas and on the Tablelands. Stem rust, particularly, was serious in late sown crops in the Central Coastal area. It was also severe on December-sown oats and volunteer plants on the Northern Tablelands in the autumn. Leaf rust was troublesome on late sown crops, particularly those grown for fodder purposes in Central Coastal areas.

LEAF SPOT (Helminthosporium avenae) was observed in Southern N.S.W., where the disease was widespread without being serious, and on the Northern Tablelands. The disease was also reported from Western districts.

FOOT ROT (Helminthosporium sp.) was reported only from the Murrumbidgee Irrigation Area, where it was responsible for a minor degree of damage.

SPECKLED BLOTCH (Leptosphaeria avenaria = Septoria avenae) was not as prevalent as usual and was observed to any extent only in Southern Riverina.

BACTERIAL STRIPE (Pseudomonas striafaciens) occurred widely throughout the State without being of any consequence.

HALO BLIGHT (Pseudomonas coronafaciens) was observed at Uralla but infection was slight.

BARLEY:

SCALD (Rhyncosporium secalis) was the most serious disease observed in barley crops in N.S.W. during 1946/47. It was particularly widespread in Southern districts and in Eastern Riverina.

STEM RUST (Puccinia graminis tritici) was observed in crops on the Northern Tablelands and in South-Eastern Riverina. Damage was not serious in Northern areas, whilst infection occurred too late in the season to materially affect yields in Southern Riverina.

POWDERY MILDEW (Erysiphe graminis hordei) was serious on late sown crops grown for fodder purposes in Central Coastal districts. It was also reported from the Northern Tableland, where, however, the degree of infection was slight.

COVERED SMUT (Ustilago hordei) was observed in a number of crops in South-Eastern Riverina. Infection, for the most part, was slight but occasional crops of the variety Pryor showed 3-4% infection.

NET BLOTCH (Helminthosporium teres = Pyrenophora teres) was observed at Henty and Culcairn in Southern N.S.W. Infection, however, was slight and yields were not materially affected.

RYE:

LEAF RUST (Puccinia dispersa) was observed on the Northern Tablelands. Infection was slight and the disease was responsible for little damage.

No other records of disease on rye were made during the season.

BROOM MILLET:

ROOT and STALK ROT (Fusarium moniliforme). Losses of up to 25% occurred this season in broom millet crops in the Richmond River district. The outbreak made its appearance in early January following a period of hot dry weather. Losses were most severe in advanced crops, later sown crops showing little evidence of the disease.

LEAF BLIGHT (Helminthosporium turcicum) was reported from the North Coast where infection was moderately severe in some crops in the Richmond River district.

BASAL STALK ROT (Colletotrichum sp.) associated with a lodging condition and leaf blight, was reported from Woodburn (North Coast).

HUNGARIAN MILLET:

ROOT and BASAL STALK ROT (Fusarium and Colletotrichum spp. associated) was reported from Berrigal Creek, North-West area, where it was responsible for a minor degree of damage.

JAPANESE MILLET:

LEAF SPOT (Helminthosporium sp.) was recorded from Prospect, Central Coast, where it caused minor damage. The disease was also recorded on Sudan grass in the same area.

GRAIN SORGHUM:

KERNEL SMUT (Sphacelotheca sorghi) was recorded from several localities in the North West, where a large acreage was sown to sorghum, this season. In no instance, however, was the degree of infection of a serious nature.

BASAL STALK ROT (Colletotrichum sp.) was widespread in the North West, being recorded from Tamworth, Inverell, Gunnedah and Berrigal Creek. It was not responsible, however, for any serious reductions in yield.

ROOT ROT (Fusarium moniliforme = Gibberella moniliformis) caused minor damage in the Tamworth district.

SEEDLING BLIGHT (Fusarium sp.) was reported from Berrigal Creek.

DUMMY HEAD (insect attack associated with secondary organisms) was widespread in the North West.

POLLEN BLAST (non-parasitic). Hot drying winds which occurred in many districts at the flowering stage, were responsible for some reduction in yield.

GRAIN MOULD (Tricothecium roseum = Cephalothecium roseum) was reported from Grafton.

RUST (Puccinia purpurea) was present to a minor degree at Taree.

MAIZE:

COB ROT (Fusarium moniliforme = Gibberella moniliformis, Gibberella fujikuroi var. subglutinans and Gibberella saubinetii) was prevalent on the Northern Tablelands. It was particularly serious in the poorly tip-covered variety Wellingrove, which is widely grown in this area. In the majority of instances infected cobs had been previously damaged by hail and/or bird attack.

ROOT and STALK ROT (Fusarium moniliforme) and (Gibberella fujikuroi var. subglutinans) was observed on the Northern Tablelands and was also reported from coastal areas. In the majority of instances damage was not serious. However, the hybrid maize yield trial plots at the New England Experiment Farm showed a high degree of infection.

LEAF BLIGHT (Helminthosporium turcicum) was observed at Armidale and on the Central Coast. In both areas, infection resulted in only minor yield losses.

SEEDLING BLIGHT (Gibberella saubinetii) caused minor reduction in seedling stands in the Mount George area.

RUST (Puccinia sorghi) was widespread without being responsible for any serious reductions in yield. It was observed on the Northern Tablelands, the Central Coast and in the Bathurst district.

DRY ROT (Diplodia zeae) was observed causing minor damage in the Richmond-Windsor area and on the Northern Tablelands. It was also responsible for minor losses on the North Coast.

HEAD SMUT (Sorosporium reilianum) was reported from the North Coast where it was more prevalent than usual.

AMERICAN MAIZE SMUT (Ustilago maydis). The first systematic survey for six years of maize crops in the Bathurst district, where maize smut appeared in 1911 and again in 1919, 1935 and 1938, was carried out this season. No evidence of the disease infection was observed in any of the crops inspected during a comprehensive survey embracing forty-nine properties in the Duramana, Peel, Orton Park, Perthville, George's Plains, Lagoon, Kelso and Mount Panorama areas and in the immediate vicinity of Bathurst.

In addition to the Bathurst survey, a maize and sweet corn crop inspection programme, covering all known plantings of imported seed, was implemented this season. The inspections were made following the detection of spores of Ustilago maydis on grains of hybrid maize consigned to the New South Wales Department of Agriculture from Iowa, U.S.A.

Areas of approximately 40 and 260 acres at Armidale and Windsor respectively were inspected without any evidence of the disease being observed.

RICE:

No parasitic diseases of rice have been recorded in N.S.W. since 1930.

However, there was some secondary MOULD development (*Alternaria* sp.) following upon bird and insect damage to heads in many crops on the Murrumbidgee Irrigation Area. The condition was particularly common in the Griffith area.

SUDAN GRASS:

LEAF SPOT (*Helminthosporium* sp.) caused slight damage in the Prospect district, Central Coastal area.

SUGAR CANE:

Information supplied by the Colonial Sugar Refining Co. shows that during the 1946/47 season, 309,655 tons of sugar cane were crushed. Losses due to disease were estimated as follows:-

FIJI DISEASE (virus) ...	2,605	tons
MOSAIC (virus)	224	"
RED STRIPE (*Xanthomonas rubrilineans*)	147	"
Total:	2,976	"

It will be seen that losses were low during the season, amounting to less than 1% of the total tonnage crushed.

FIJI DISEASE (virus) was by far the most important disease, particularly in the Richmond and Clarence Rivers areas where its continued recurrence constitutes a threat to the sugar cane industry.

MOSAIC (virus) occurred on the variety Akbar in the Clarence River area, but was not observed on other varieties. The disease was not serious on the Richmond River. Largely because of the elimination of the susceptible variety Comus, the incidence of mosaic in the Tweed River area showed a noticeable decrease this season.

RED STRIPE (*Xanthomonas rubrilineans*) occurred on the variety Pollux, in the Clarence River area, but the disease was not serious.

LEAF SCALD (*Bacterium albilineans*). Minor outbreaks of this disease occurred at Teven Creek and Broadwater in the Richmond River area.

EYESPOT DISEASE (*Helminthosporium sacchari*). Severe infection occurred in some crops of the variety Atlas in the Clarence River area during the winter months. Trace infection was observed in a number of other varieties.

GUMMING DISEASE (*Xanthomonas vasculorum*) was present in the Richmond River area but the degree of infection was not serious. The Tweed River area is now apparently free from this disease.

SWEET CORN:

ROOT and STALK ROT (Gibberella saubinetii) caused marked reductions in yield in some crops in the Richmond-Windsor district. The disease was more apparent in late crops, early sown crops being remarkably free from attack.

DRY ROT (Diplodia zeae) developed to a minor extent in the Windsor area.

EAR ROT (Fusarium moniliforme = Gibberella moniliformis) and (Gibberella saubinetii) was present to a limited extent in the Richmond-Windsor area. Attack frequently followed corn-ear worm injury.

LEAF BLIGHT (Helminthosporium turcicum) was present in the Richmond-Windsor area, and although the severity of attack increased towards the latter part of the season, it did not develop to the same extent as it did in 1945/46 and no serious losses resulted.

RUST (Puccinia sorghi) was widespread on the Northern Tablelands and the Central Coast, but infection was not serious and losses were negligible.

BLAST (non-parasitic). Hot, dry winds in December caused a blasting of pollen in crops in the Richmond-Windsor district. Damage, however, was not serious and even in the most severely affected crops, not more than 1% damage resulted. The condition was also observed in the Armidale area. Leaves were also frequently "scorched" by wind action.

GRASSES:

BARLEY GRASS (Hordeum leporinum).

LEAF SPOT (Helminthosporium sp.) was observed in both the Riverina and the North West.

BUFFALO GRASS (Stenotaphrum secundatum).

LEAF SPOT (Piricularia sp.) caused considerable damage to some lawns in the Metropolitan Area during the summer months.

COCKSFOOT (Dactylis glomerata).

STEM RUST (Puccinia graminis avenae) was observed in Southern Riverina. The affected plants, which were only lightly affected, were in a rye grass - clover - cocksfoot pasture in close proximity to an irrigated oat crop, heavily infected with stem rust.

COUCH GRASS (Cynodon dactylon).

BROWN PATCH (Rhizoctonia solani) was prevalent in the Metropolitan Area. It was also reported from Wagga Wagga and Wollongong.

SMUT (Ustilago cynodontis) was also prevalent in the Metropolitan area.

CREEPING BENT GRASS (Agrostis stolonifera).

BROWN PATCH (Rhizoctonia solani and Helminthosporium and Curvularia spp. assoc.) was reported from the Metropolitan area and from the Riverina.

FAIRY RING (undetermined) was reported from La Perouse and Wentworth.

CURLY WINDMILL GRASS (Chloris acicularis).

SMUT (Ustilago valentula) was observed on occasional plants at Temora.

KENTUCKY BLUE GRASS (Poa pratensis).

LEAF RUST (Puccinia poarum) was recorded from the Northern Tablelands.

PASPALUM (Paspalum dilatatum).

ERGOT (Claviceps paspali) assumed almost epiphytotic proportions in many areas. It was particularly prevalent on the Central Coast and Northern Tablelands. The disease was recorded for the first time on the Murrumbidgee Irrigation Area, where a moderate degree of infection occurred. The pathogen was frequently parasitised by species of Cerebella and Fusarium.

PERENNIAL RYE GRASS (Lolium perenne).

STEM RUST (Puccinia graminis lolii) was observed in Southern Riverina, where slight to moderate infection occurred in several irrigated pastures.

PRAIRIE GRASS (Bromus unioloides).

SMUT (Ustilago bromivora) was widespread on the Northern Tablelands and occurred to a lesser extent on the Central Coast.

PURPLE WIRE GRASS (Aristida ramosa).

SMUT (Sorosporium consanguineum) was reported from the Guyra district.

QUEENSLAND BLUE GRASS (Dichanthium sericeum).

ERGOT (Claviceps pusilla), in association with Cerebella sp., was recorded from Guyra. This constitutes the first record of this disease in New South Wales.

RED LEG GRASS (Bothriochloa decipiens).

SMUT (Sphacelotheca amphilophis) was observed on the Northern Tablelands.

ERGOT (Claviceps pusilla), in association with Cerebella sp., was observed at Glen Innes. This is the first record of this disease in New South Wales.

SUMMER GRASS (Digitaria adscendens).

LEAF SPOT (Piricularia sp.) caused considerable injury to foliage following substantial February rains in the Pennant Hills and Wyong districts.

WATER COUCH (Paspalum distichum).

ERGOT (Claviceps paspali), in association with species of Cerebella and Fusarium, was observed in the Metropolitan area.

WIMMERA RYE GRASS (Lolium rigidum).

STEM RUST (Puccinia graminis lolii) was observed in several irrigated pastures in the Berriquin Irrigation Area.

FIELD AND FORAGE CROPS.

CLOVERS.

RUST (Uromyces trifolii) was reported from the South Western Slopes on Subterranean clover (Trifolium subterraneum). Scattered plants were heavily infected.

MOSAIC (virus) was observed on red clover (Trifolium pratense) and Bokhara clover (Melilotus alba).

COTTON.

LEAF SPOT (Alternaria sp.) was the only disease recorded on cotton. It was observed at Glenfield, where several plants were slightly infected.

LINSEED.

RUST (Melampsora lini) was reported from the Murrumbidgee Irrigation Area. Infection was slight.

LUCERNE.

LEAF SPOT (Pseudopeziza medicaginis) was the most widespread disease of lucerne, being reported from the Central Tablelands, Riverina and Central Coastal districts. Only on the Central Coast, where it was responsible for considerable defoliation, did it develop to any serious extent.

DIE-BACK (Ascochyta sp. assoc.) was reported from the Central Coast and the South Western Slopes.

VIOLET ROOT ROT (Rhizoctonia crocorum) caused considerable loss of plants in a lucerne stand at Nowra. It was not reported elsewhere in the State.

RUST (Uromyces medicaginis) was widespread but, in general, was not responsible for any serious losses. Occasional stands in the Metropolitan area grown under overhead irrigation were heavily infected.

BLACK STEM (Phoma medicaginis) was reported causing minor damage only on the Central Tablelands.

WITCHES' BROOM (virus) was reported from both Southern New South Wales and the Hunter River and Manning River districts. One four-year-old grazing stand at Finley in the Southern Riverina showed a 20% infection with this disease.

ROOT ROT (Rhizoctonia bataticola Mactophomina phaseoli) was reported from the North Coast.

BACTERIAL BLIGHT (Pseudomonas medicaginis) was present to a serious extent in one stand at Bathurst.

STEM NEMATODE (Tylenchus dipsaci) was reported from the North Coast.

LUPINS.

ROOT ROT (Pythium sp.) was observed in the Metropolitan area.

No other diseases of lupins were recorded during the season.

MEDICS.

MOSAIC (virus) was reported on BURR MEDIC (Medicago denticulata) from the Murrumbidgee Irrigation Area.

LEAF RUST (Uromyces sp.) was observed on occasional plants of SPOTTED MEDIC (Medicago arabica = M.maculata) in the Richmond-Windsor area.

PEANUTS.

SCLEROTINIA ROT (Sclerotinia sclerotiorum) attacked a home garden plot of peanuts at Gosford.

STEM BLIGHT (Botrytis cinerea) caused severe damage to small crops grown at Dark's Forest (Sydney) and at Gosford.

SOYBEANS.

BACTERIAL BLIGHT (Pseudomonas glycinea) although common in soybean crops this season, was not responsible for any marked reductions in yield. It was reported from the Northern Tablelands, North Western Slopes and the Murrumbidgee Irrigation Area.

BACTERIAL PUSTULE (Xanthomonas phaseoli var. sojense) was observed on the Northern Tablelands.

LEAF SPOT (Alternaria sp.) was reported from the Metropolitan area.

MOULD (Fusarium, Rhizopus and Cladosporium) was present in seed, held in storage in the Metropolitan area.

SUNFLOWER.

SCLEROTINIA ROT (Sclerotinia sclerotiorum) caused severe damage to flowering heads of sunflowers on the South Coast.

TOBACCO.

BLUE MOULD (Peronospora tabacina) was again present but was not responsible for any substantial losses.

ROT KNOT (Heterodera marioni) was reported to be troublesome in the Ashford district.

FRUIT.

CANE FRUITS.

LOGANBERRY.

RUST (Phragmidium sp.) was recorded, causing early defoliation in a Metropolitan nursery.

RASPBERRY.

LEAF SPOT (Septoria sp.) occurred in commercial crops at Mt. Pritchard and Robertson, but caused very slight damage.

YOUNGBERRY.

ANTHRACNOSE (Elsinoe veneta). Moderately severe leaf and cane spotting developed in a commercial block at Robertson and in Metropolitan gardens following autumn rains.

CITRUS FRUITS.

PHYTOPHTHORA ROOT AND COLLAR ROT (Phytophthora citrophthora). The position with regard to citrus root and stem rot in nurseries, particularly those in the Metropolitan area, is still unsatisfactory. Following wet conditions in February, one seedbed of approximately 250,000 seedlings became affected by shoot blight and root rot. The land had not grown citrus for ten years previously, but surface drainage was poor and the soil a rather heavy type. Seedlings planted out in nursery rows from an infested seedbed in spring 1946 have shown very unsatisfactory development in spite of dry conditions during spring and early summer. Though only healthy seedlings were selected for planting, approximately 50% now show the effects of moderate to severe root injury. The remainder have made good growth, but a certain amount of infection is undoubtedly present and may develop further if wet conditions are experienced before the trees are planted out. About 100,000 trees are involved. In two smaller nurseries a similar position exists.

Following late summer rains, outbreaks of stem girdle occurred amongst budded trees of lemon and to a less extent of orange, in all the main Metropolitan nurseries, and in two nurseries considerable root rot occurred amongst budded trees of orange and mandarin.

Some losses have been experienced amongst autumn (1947) planted trees in the Mangrove Mountain area and in the Hills district in newly cleared land. Infection occurred in the nurseries.

Spring (1946) planted trees in the Murrumbidgee Irrigation Areas have made satisfactory growth for the most part, nursery stock being much less infected than in the previous spring. Heavy losses occurred amongst young trees planted in spring 1945 in the Murrumbidgee Irrigation Areas (see previous report) and many partly affected trees which made some growth during the year were badly frosted during the winter of 1946. Improved irrigation methods and a succession of dry winters since 1942 have arrested to some extent, decline due to root rot amongst older trees in the Murrumbidgee Irrigation Areas. A considerable number of trees, however, are removed annually because of unsatisfactory performance.

Root rot has caused considerable mortality amongst mature trees of Emperor mandarin and orange along the Colo River and at Sackville Reach and Wiseman's Ferry, on the Hawkesbury River. Affected trees are for the most part in low ground liable to flooding or receiving drainage water from adjacent slopes. Trees on Poncirus trifoliata stock are growing very satisfactorily in these localities.

Additional cases have been recorded of blocks of mature trees of lemon and orange affected by root rot at Peats Ridge, Somersby, Lisarow and in the Hills district. In all cases, drainage was defective or soil of a heavy type.

Collar rot of lemons was again prevalent in home gardens in the Metropolitan area and in commercial orchards in the Hills district.

BLACK SPOT (Phoma citricarpa) developed in epiphytotic proportions during spring and summer in the Gosford district, and losses of late-hanging fruit were particularly high.

First lesions were observed on maincrop Valencias in early August and on Washington navels somewhat later. The disease reached its peak in October and early November, and was more severe in orchards on sandy soils than in orchards on heavy soils. Where irrigation was practised, the severity of the disease was less. Rains received in mid-November resulted in an easing off of the development and as most fruit commenced to regreen about then, not much further loss was experienced.

Several factors contributed to the severity of the outbreak. A dry spring of long duration, with dry atmospheric conditions, was ideally suited to produce a Black Spot epiphytotic. During the war growers marketed fruit as early as possible to fill Army contracts, and spot development had been unimportant. Consequently, spraying was not generally practised. This season, the entire Valencia crop was allowed to hang into the late spring and early summer, and was thus very liable to Black Spot development.

Where the 3 and 4 spray programmes recommended were adopted, good control was achieved. Copper oxychloride preparations used as substitutes for Bordeaux Mixture have not given as satisfactory control.

Black Spot development commenced early in the Hawkesbury River and Hills districts, and most fruit was marketed early.

MELANOSE (Phomopsis citri). Main crop oranges in the Gosford-Mangrove Mountain area were fairly free of infection, due to dry conditions of spring. Intermediate crop fruit showed very considerable infection and autumn leaf growth on lemons and oranges was badly marked. Fruit on aged trees of orange and mandarin in the Hills district and Hawkesbury River showed considerable skin blemish. Main crop fruit at Mount George was also infected.

Autumn growth on cutback trees in the Gosford district was severely affected, wet weather at that time favouring the development of the disease. Spring growth on these trees was healthy. The practice of heaping the wood removed during cutting back around the butts of skeletonised trees as a protection against sunscald has the undesirable effect of producing an abundance of inoculum for infection of new growth, and also of any weak limbs.

Some branch die-back was observed at Gosford and in the Hills district.

ARMILLARIA ROOT ROT (Armillaria mellea) continues to take toll of trees in the Mangrove Mountain, Maroota, and Hawkesbury River districts. During warm wet weather in April-May, clusters of fructifications were produced in abundance around affected trees at Maroota and Mangrove Mountain. Persistence of infection in buried bloodwood roots for 16 years after clearing was recorded at Mangrove Mountain.

LEMON SCAB (Sphaceloma fawcettii scabiosa). Because of dry conditions during the spring, maincrop lemons were very free of the disease. Late set lemons in the Gosford district, Kulnura and Hills district showed very considerable scab development, since wet conditions at flowering time were conducive to the development of the disease. Many growers are achieving satisfactory control with 4-4-80 Bordeaux Mixture. This strength would appear to be adequate for control where routine spraying has been adopted over a period of years.

Heavy infection of rough lemon stocks in nurseries at Gosford and Terrigal occurred during the autumn.

BROWN ROT (Phytophthora citrophthora) was recorded from Mount George on navel oranges, from Lismore on Thompson grapefruit and from the Metropolitan area on lemons and oranges following February rains. An outbreak occurred in March at Peats Ridge, lemon fruit, leaves and young shoots and Washington navel fruit were affected. The 3-spray black spot programme does not protect fruit against autumn infection by the brown rot fungus.

SEPTORIA SPOT (Septoria depressa). Moderate infection occurred on unsprayed Valencias in parts of the Murrumbidgee Irrigation Areas.

SCLEROTINIA BLIGHT (Sclerotinia sclerotiorum) was recorded affecting rough lemon seedlings in a number of Metropolitan nurseries and at Mangrove Mountain during late autumn. Losses were insignificant.

RHIZOCTONIA COLLAR ROT (Rhizoctonia solani). Rough lemon seedlings in nurseries at Gosford and Richmond showed some infection during warm wet weather in March.

MANDARIN BROWN SPOT (?Pseudomonas syringae). Emperor mandarins in the Hawkesbury River area and at Glenorie showed a slight amount of infection.

SOOTY BLOTCH (Gloeodes pomigera) was recorded on unsprayed Washington navel oranges and Emperor mandarins and Wheeny grapefruit in the Hawkesbury River area, Lisarow, Terrigal and Wyong.

CITRUS BLAST (Pseudomonas syringae) was recorded from Pomona (Wentworth district, lower Darling River) affecting Valencia oranges. Fruit on exposed side of trees only was affected, and losses were slight.

BLUE MOULD (Penicillium spp.). Some moulding of lemon, mandarin, Washington navel orange, and grapefruit occurred in the Central Coast district during late autumn. Infection followed fruit fly stings.

ROOT KNOT (Heterodera marioni). Rough lemon seedlings in two Metropolitan nurseries were found to be severely stunted as the result of fairly heavy root knot infection. The infested area was small in each case.

PSOROSIS (virus) was recorded at Lisarow and Wyong on 20-year-old Washington navel orange trees and on 25-year-old Washington navel trees at Griffith.

EXANTHEMA (copper deficiency) was widespread on young trees of all varieties in the Gosford district. Replanted trees in particular were badly affected.

YELLOW LEAF (magnesium deficiency). Many orchards in the Gosford district exhibit symptoms of this deficiency. For some years high grade dolomite has been difficult to obtain, but supplies are now available and the position should improve. Dressings of 2 and 4 lbs. per tree of magnesium sulphate to mature lemon trees in conjunction with sulphate of ammonia applications, gave no control. Serious magnesium deficiency was also recorded from Barham (Murray River). Combined deficiencies of magnesium and copper are not uncommon in the Gosford district, the symptoms being exaggerated by excessive applications of nitrogenous fertilisers.

MOTTLE LEAF (zinc deficiency) was widespread as usual in the Murray River settlements, and parts of the Murrumbidgee Irrigation Areas, and was recorded also from Gunnedah. Old lemon and orange trees in many parts of the Mangrove Mountain-Somersby area are also affected but have responded to zinc sulphate - hydrated lime spray applications. In these areas zinc deficiency often occurs with copper and possibly magnesium deficiency.

BURNT LEAF (potash deficiency). Response has been obtained to dressings of potassium sulphate at Kenthurst. Symptoms were observed on Washington navel trees at Dural during early autumn.

WHEENY DIEBACK (cause probably nutritional). Die-back associated with heavy cropping of Wheeny grapefruit was recorded from a number of localities in the Gosford and Hills districts.

MANDARIN SCALD (cause probably nutritional). A slight development of scald took place on Emperor mandarin trees carrying excessive crops at Glenorie.

DRY STEM (cause not known) was recorded on Thorny mandarins in the Metropolitan area and oranges at Windsor.

COPPER TOXICITY. Severe damage was observed following application of 2 lbs. copper sulphate per tree in an orchard at Mangrove Mountain. Many 4-year old trees were killed.

BORON TOXICITY. Mild and severe symptoms of what appears to be boron toxicity were observed in Valencia orange trees at Mardi. The trees are 5 years old and were planted in virgin land.

SALT INJURY. Adequate winter rains were received in the Curlwaa and Coomealla irrigation settlements, which had the effect of removing accumulations of salt from surface soil layers. The trees injured during the previous spring have made a good recovery.

OLEOCELLOSIS (oil liberation) was quite marked on Washington navel oranges at Barham, following damp autumn conditions. It was also observed in the Murrumbidgee Irrigation Areas and at Gosford.

FRUIT DROP (seasonal). Severe fruit shedding occurred in parts of the Mangrove Mountain and Hills district during November 1946. This was due largely to the abnormally long spell of dry weather during late winter and spring. Some fruit drop which occurred where soil moisture conditions were satisfactory is thought to be due to incipient exanthema. Trees which suffered this fruit fall have set a fair intermediate crop.

FROST INJURY. Very severe late frosts in parts of the Murrumbidgee Irrigation Areas caused considerable burning of leaves and young growth. The trees subsequently made a good recovery and most set a moderate crop.

LEAF CURL. Leaf puckering was prevalent on Wheeny grapefruit in the Metropolitan area. Affected leaves are those formed in the spring, and cool weather is believed to be the cause.

POME FRUITS.

The 1947 harvest was below normal, the major factor contributing to the reduced yield being drought.

APPLE.

BLACK SPOT (Venturia inaequalis) caused no losses in orchards receiving the recommended control sprays, and the incidence of the disease on unsprayed trees was very low. However, some leaf spotting occurred on trees which did not receive the lime sulphur cover sprays in the Orange district, and this phase of the disease was evident to a minor degree even on sprayed trees in the Batlow district. A little late spotting of fruit occurred particularly on the later varieties at Orange, in spite of drought conditions; heavy dews were probably responsible for this infection.

The disease was again prevalent in the Red Range area of the Northern Tablelands, where a prolonged period of wet weather occurred in the late summer and autumn. The disease does not constitute a problem in other Northern Tableland orchards.

DIEBACKS (various causes). Losses throughout the State from dieback were less severe than during the previous season. On the coast the activity of the pathogenic fungus Dothiorella was very slight due to the dry spring and summer. Investigations on the dieback complex associated with this fungus are proceeding.

The dieback position in the Orange district has been less severe this season as a result of closer attention by growers to the nutritional needs of their trees and the occurrence of good spring rains.

On the Northern Tablelands, the amount of dieback as a result of boron deficiency and of excessive applications of this element, is decreasing.

In the Batlow district, diebacks do not constitute a problem, whilst on the Murrumbidgee Irrigation Areas the main cause of dieback was excessive concentration of salt in the soil.

POWDERY MILDEW (Podosphaera leucotricha) was widespread throughout the Northern Tablelands, and its persistent attack is leading to a gradual decline in tree vitality. However, where a lime sulphur spray programme is applied, the disease is very efficiently controlled.

The disease was also evident in the more neglected orchards in the Orange district, but in general, the lime sulphur sprays applied for the control of black spot were also effective against this disease.

McINTOSH RED TRUNK CANKER (Dothiorella sp.). This disease, which is confined mainly to the McIntosh Red variety in the Oakdale-Oaks-Orangeville area, was very slight this season.

It is now thought that a small wood boring beetle (not yet identified) may be associated with this disease. Investigations into the etiology and control of this disease are in progress.

BITTER PIT (physiological) was not particularly troublesome in spite of the hot dry summer, but tree pit of the normal type was noted on large fruits from young trees of Delicious at Oakdale and Orange, and on Cleopatra at Batlow. Affected fruits were badly pitted, although the proportion of affected fruits was not great.

At Orange a block of young Democrat trees carried a fairly light crop which was badly affected with the blotchy type of tree pit.

This disease was also present in isolated cases in suburban and coastal orchards.

WATERCORE (physiological). The hot dry conditions which prevailed during December, January and the early part of February, contributed to a relatively high incidence of this disease. It was observed in many varieties and occurred throughout the State, but was particularly prevalent in the County of Cumberland.

LITTLE LEAF (zinc deficiency) was again common on untreated trees on the Murrumbidgee Irrigation Areas. Orchards affected to a moderate degree were also noted at South Kentucky and Uralla.

AUSTRALIAN SOOTY BLOTCH (Leptothyrium fuliginosum) was recorded from an orchard at Tenterfield.

VARIEGATION (? virus). This disease was observed throughout the State on many varieties, although Jonathan appeared to be more generally affected. It was present on trees of all ages, including nursery trees. Although the disease is widespread the proportion of affected trees throughout the State is very low, and any directly detrimental effects are obscure except that affected leaves are more liable to spray burn and scorch than normal leaves.

SUNSCALD (non-parasitic) occurred on some trees in the coastal areas following very hot dry conditions during December, January and early February.

LEAF SCORCH (non-parasitic) was prevalent throughout the State as a result of the hot dry conditions which prevailed generally, and which were conducive to a rapid rate of transpiration. Under these conditions arsenical injury was intensified.

RIPE ROT (Glomerella cingulata) occurred in a few orchards on the Central Coast.

CRINKLE (watercore breakdown) was fairly common in coastal districts due to the prolonged hot dry period in mid-summer.

FROST DAMAGE, in the form of frost banded fruit, was recorded from an orchard at Griffith. Frosts at Batlow at blossoming time caused considerable losses.

LEAF SPOT (Phyllosticta sp.). Infection was slight to moderate on unsprayed trees at Orange.

PEAR.

BLACK SPOT (Venturia pyrina). No losses from this disease were recorded this season.

FLECK (Entomosporium maculatum) was recorded on occasional trees throughout the Batlow district, the heaviest infection occurring on trees in a nursery. Fleck was also recorded on yearling pear stocks in a Carlingford nursery, but in all cases the trees were well grown and the disease was of no consequence.

DIEBACKS (causes unknown) were in evidence in some areas but caused no immediate losses. This crop suffers less from diebacks than does the apple. No pathogenic organism has been isolated.

FROST which occurred at blossoming time at Batlow, was responsible for a considerable reduction of yield from this crop.

QUINCE.

FLECK (Entomosporium maculatum). A very heavy infection was recorded on yearling stocks in a Carlingford nursery. Wet warm conditions favoured the attack, but the trees were well grown. This disease was also noted on scattered quince trees within the County of Cumberland.

LIME INDUCED CHLOROSIS (iron deficiency) was recorded in four localised areas within a block of 9-year old trees at Yenda. Affected trees produced no fruit, the leaves were very chlorotic and the growth markedly reduced.

The soil in the vicinity of affected trees had a pH range of 8.0 to 8.5, whilst the pH of the soil near unaffected trees was 7.5.

FROST injury in the form of typical frost banding due to a late spring frost, occurred at Griffith. The proportion of damaged fruit was small.

STONE FRUITS.

In spite of the drought, stone fruit harvests in most districts were fairly normal.

The season was not favourable to the development of pathogenic diseases, though the incidence of rust was high in some cases on the coast, following heavy rains in February and April.

ALMONDS.

FROST caused serious damage to the almond crop in the Young district. In low lying areas where trees in a poor state of health were growing in heavy red soil with insufficient moisture, crop losses ranged up to 100 per cent.

CROWN GALL (Agrobacterium tumefaciens) was recorded on young trees at Wagga Experiment Farm.

SHOT HOLE (Clasterosporium carpophilum) was of general occurrence, particularly in the Young district.

APRICOT.

BACTERIAL CANKER (Pseudomonas cerasi var. prunicola). The incidence of this disease was negligible this season, although some activity occurred in the Murrumbidgee Irrigation Areas, on trees which had been badly infected the previous season.

BROWN ROT (Sclerotinia fructicola) caused practically no losses this season, except for occasional damage in suburban areas.

SHOT HOLE (Clasterosporium carpophilum) occurred throughout the State on trees which had not received the leaf-fall spray. Observations again indicated that the spur burst spray was insufficient to control this disease.

A notable case of the reduction of inoculum of this disease is afforded from the experience of the Bacterial Canker experiments at Leeton, where leaf fall, dormant, and bud swell sprays of Bordeaux Mixture have been applied for two years. These trees are entirely free of shot hole.

In the Kurrajong-Richmond-Windsor area, fruit infection of early varieties was severe although leaf infection was moderate.

SALT INJURY occurred in some orchards, particularly at the Griffith end of the Murrumbidgee Irrigation Areas, and was recorded also at Narromine.

FRECKLE (Cladosporium carpophilum) occurred to a slight degree on some unsprayed trees this season, but caused no losses where trees had been sprayed.

ZINC DEFICIENCY was again present in the Murrumbidgee Irrigation Areas.

LIME INDUCED CHLOROSIS (iron deficiency) was observed in an orchard at Yenda. The leaves were very chlorotic, the growth reduced and affected limbs carried no fruit. The pH of the soil in the root zones of affected trees was approximately 8.5 whilst that in unaffected areas was approximately 7.0.

CHERRY.

BACTERIAL CANKER (Pseudomonas cerasi var. prunicola) caused no further damage anywhere in the State this season, and no new infections were noted.

BROWN ROT (Sclerotinia fructicola). The incidence of the disease was negligible, in spite of the fact that in the Orange district heavy rain was experienced just prior to the harvesting of the Early Lyons crop. Large quantities of ripe fruit split and were left on the trees but no brown rot was seen to develop on this fruit.

CROWN GALL (Agrobacterium tumefaciens) was observed to be sufficiently severe in one orchard at Orange to necessitate the removal of a small percentage of trees. Many others were infected to a lesser degree, and were in a state of decline due to the dual effect of drought and this disease.

SHOT HOLE (Clasterosporium carpophilum) was of general occurrence this season throughout the Orange district, where the inoculum of this pathogen is building up, indicating the necessity for the general application of a leaf fall spray as well as the bud swell spray.

A particularly severe infection of leaves and shoots was noted in the Early Rivers variety at The Oaks, and the disease was also observed on nursery trees in the County of Cumberland. Shot hole was also prevalent in the Young district, whilst on the Northern Tablelands and at Batlow the incidence was slight.

FROST caused heavy losses of the developing ovules of cherries and particularly the St. Margaret variety, growing in low lying areas in the Orange district. A severe frost late in October caused further damage.

The crop was also damaged in low lying areas of the Young district.

LEAF CURL (Taphrina minor). One instance of very slight infection was observed in the Orange district.

NECTARINE.

BROWN ROT (Sclerotinia fructicola) caused no losses this season except in odd instances in the County of Cumberland. In the Orange district some brown rot appeared after harvesting on windfall fruit, and on fruits which remained on the tree.

FRECKLE (Cladosporium carpophilum) occurred in a number of instances on unsprayed trees. However, excellent control was obtained by spraying and no commercial loss was sustained on sprayed trees.

RUST (Puccinia pruni-spinosae) caused some premature defoliation but the general incidence of the disease was light.

SHOT HOLE (Clasterosporium carpophilum) was widespread in its occurrence but severe infection was not recorded.

LEAF CURL (Taphrina deformans) was not recorded on trees which received a bud swell spray, and even on unsprayed trees the incidence of this disease was very light.

DROUGHT. It has been reported from the Orange district that in some areas nectarines failed to ripen, becoming brownish in colour and shrivelling on the trees. This has been attributed to an environmental complex, the major factor in which appears to be drought.

WATERLOGGING was responsible for the decline of a number of trees in a small orchard in the Camden area. In the affected area a clay subsoil almost impervious to water was experienced at a depth of approximately 8 inches.

PEACH.

BROWN ROT (Sclerotinia fructicola). Owing to the very dry spring, this disease caused no major losses to orchardists this season, even on the Murrumbidgee Irrigation Areas where the disease was particularly severe last season, resulting in the formation of large numbers of "mummies", as well as limb cankers and dieback of many laterals.

Some growers sustained small losses of the late variety Pullar's Cling. However, the disease developed in fruit transported to Sydney and in at least one instance heavy loss was reported.

CROWN GALL (Agrobacterium tumefaciens) was again severe in nurseries, particularly in the County of Cumberland, although the incidence of the disease was less severe than in the preceding season. Orchardists continued to suffer losses, particularly of young trees. Also, an unusually large number of old infected trees succumbed to the disease this season, drought being a contributory factor.

RUST (Puccinia pruni-spinosae). In coastal areas the incidence of this disease was slight to moderate with severe infection and early defoliation in a few orchards. Rust inoculum appears to be building up in these areas, although the moist warm autumn was responsible for this immediate increase.

Dry conditions prevailed on the Murrumbidgee Irrigation Areas and Tableland districts, and the disease was of no consequence. In some Tableland areas heavy dews aided a slight attack.

SHOT HOLE (Clasterosporium carpophilum). In spite of a very dry spring, the incidence of leaf infection on the Murrumbidgee Irrigation Areas was very heavy, being more severe at the Leeton end than at Griffith. However, no loss was sustained from fruit infection which was extremely slight. Observations have again indicated that the bud swell fungicidal spray alone is not sufficient to control this disease.

Leaf infection occurred to a slight degree in Tableland areas, and to a greater extent on coastal trees, on which a little fruit infection also occurred.

LEAF CURL (Taphrina deformans) was not observed on trees which had received a fungicidal spray at the bud-swell stage. The incidence of the disease on unsprayed trees was very low.

ZINC DEFICIENCY was recorded on the Murrumbidgee Irrigation Areas.

LIME INDUCED CHLOROSIS (iron deficiency) was observed in an orchard at Yenda. The leaves were very chlorotic, the growth restricted and affected limbs carried no fruit. The pH of the soil in the root zones of affected trees was approximately 8.5, whilst that in unaffected zones was approximately 7.0.

ROOT KNOT (Heterodera marioni) infection was heavy in parts of a nursery at Carlingford, and was also responsible, in part, for the death of a number of young trees in an orchard at Griffith.

FRECKLE (Cladosporium carpophilum) occurred on occasional unsprayed trees, but no commercial loss was sustained and the disease was not recorded from trees which had been sprayed.

FROST affected early peaches on the Central Coast, resulting in the shedding of the crop in many instances.

POWDERY MILDEW (Sphaerotheca pannosa) was recorded on young trees in a nursery in the County of Cumberland.

PLUM.

BROWN ROT (Sclerotinia fructicola) developed to a slight degree in late plums in the Hawkesbury River district. In the Orange district the crops were harvested free of the disease, but after harvesting brown rot became apparent on fruits lodged in the trees and on the ground.

CROWN GALL (Agrobacterium tumefaciens) was particularly severe in an orchard at Elderslie. One-year old Santa Rosa plums on plum stock growing in sandy soil (pH 6.2) were infected to the extent of about 95% in spite of the fact that the trees were quite clean when planted. The grower suffered 100% loss with the same variety in the same soil in 1945. Previous to this grapes had failed on the same soil but old apple trees removed from the block prior to planting the grapes showed no evidence of the disease.

RUST (Puccinia pruni-spinosae) was fairly widespread but the incidence of the disease was much less severe than during the previous season, particularly so in the Orange district.

SHOT HOLE (Clasterosporium carpophilum) was widespread in its occurrence, but the degree of infection was generally slight.

SCALD (physiological). The Wilson plum throughout the County of Cumberland and other coastal areas, showed evidence of scald due to unusually high late spring temperatures coupled with generally dry conditions.

TROPICAL FRUITS.

AVOCADO PEAR.

No records.

BANANA.

BUNCHY TOP (virus). Satisfactory control of this disease has been maintained by the detection service conducted by the Banana Growers' Federation in co-operation with the Department of Agriculture. In April 1947, one bunchy top infected plant was found in the isolated Yarrahappini eradication zone, the first since January 1946. Persistence of the disease in this eradication zone is confusing.

LEAF SPOT (Cercospora musae) was again general in plantations. Although losses from this disease are relatively serious, very few growers have yet adopted protective spraying. Good control was again obtained by spraying with Bordeaux Mixture (plus colloidal sulphur for Speckle control) at the experimental plots at Duranbah.

ROOT AND CORM ROT. There were no further reports of this disease. Inoculations with a strain of Rhizoctonia solani isolated in 1946 from decaying roots, indicated that this organism is capable of attacking both cord and lateral roots. An inoculation with Pythium sp. isolated in 1946, was inconclusive.

SQUIRTER (Nigrospora sphaerica) was again common on the Melbourne and Adelaide markets during the winter months. Consideration is being given to legislation, requested by the Banana Growers' Federation, to enforce compulsory dipping of fruit in salicylanilide during the susceptible period of the year.

DROUGHT and FROST INJURY. The winter of 1946 was usually dry and frosty and plantations received a bad setback which was reflected in production and quality of fruit throughout the ensuing year. Many immature bunches were shed and more advanced fruit on exposed aspects was blemished or blackened by frosts and cold winds. "Choke-throat" was very common in plants which normally would bunch in July and August. The value of bagging of bunches during the winter was strikingly demonstrated where practised.

MANGO.

POWDERY MILDEW (Erysiphe sp.) occurred on the foliage of a ten-year old tree in a home garden in the Metropolitan area in October. August and September were very dry. There were a few showers in October and heavy dews were frequent during the period when the mildew was first noticed. This disease was recorded for the first time in N.S.W. in November 1944, also from the Metropolitan area. There has been no record yet of the disease in North Coast districts, nor in Queensland. The mildew appears capable of being highly destructive to the inflorescence.

PAPAW.

CRINKLE (virus) was again evident in most plantings in North Coast districts. Disease is masked during the summer months and becomes prominent in the autumn and winter.

PASSION FRUIT.

WOODINESS (virus). Foliage symptoms caused by this virus appeared in a very striking fashion in the autumn and winter of 1947 in the Gosford district. All passion fruit plants become affected with the disease at an early stage of growth, and the display of symptoms depends upon prevailing weather conditions. Symptoms are almost completely masked in the warm months of the year in vigorously growing plants, although they are present in less thrifty plants at all times. Growth made from mid-April onwards usually shows mosaic and yellow spot symptoms, but this growth is normally restricted by the onset of cold weather in May and June. In the present season May and early June were abnormally warm with daily minima of 58°-60°F. It is thought that the warm weather favoured growth under conditions optimal for development of the virus, allowing it to reach a high concentration which influenced the display of symptoms. In some plantations the tips of shoots became very yellow, pits appeared on the young canes followed by a blighting of the terminals.

BROWN SPOT (Alternaria passiflorae). More general adoption of spraying during the summer and autumn with Bordeaux Mixture, or with copper oxychloride, is rendering this disease of less importance. Some severe outbreaks of the disease occurred in unsprayed plantations.

LEAF YELLOWING (nematode injury?). After heavy rain in February 1947, a portion of a block of passion fruit in the Wyong district in light sandy soil yellowed badly and developing fruit became wrinkled. Roots of plants in this portion of the block were found to be heavily infested with nematodes (Heterodera marioni). Plants on either side of this portion, in slightly heavier soil, were normal in colour and showed only light nematode infestation. The block was tile-drained throughout.

PINEAPPLE.

WILT (cause undet.). This disease was again relatively common in two-year and older plantings. The disease has the general characters of the wilt disease encountered in Queensland plantations with which Phytophthora cinnamomi is associated.

MISCELLANEOUS FRUITS.

FIG.

No records.

GRAPES.

DOWNY MILDEW (Plasmopara viticola). Owing to dry conditions during spring and early summer, development of downy mildew was at first slight. During the warm and humid weather of late summer and autumn, a considerable extension of the disease took place. The variety Isabella, previously immune to this disease, has in the last two years been fairly severely attacked, possibly indicating the appearance of a new race of the parasite.

BLACK SPOT (Elsinoe ampelina) was recorded from a number of localities, on the Coast and Tablelands on unsprayed vines.

CROWN GALL (Agrobacterium tumefaciens). Considerable infection of White and Black Muscat vines which had been planted out as cuttings, was reported from a vineyard at Molong. Crown Gall infection is fairly general in the Molong district.

DIE BACK (cause not known). A die-back condition was observed affecting Black Shiraz grape vines in the Griffith area. The disorder does not appear to be associated with unfavourable soil conditions, or root injury.

FRUIT DROP (seasonal). A spell of cold weather in late spring is believed to have been the cause of the failure to set a normal crop shown by late flowering varieties in all parts of the State.

A spray of beta naphthoxy acetic acid (75 ppm.) applied at blossoming to Ohanez grapes did not result in any improvement in the unsatisfactory fruit set characteristic of this variety at Griffith.

LOQUAT.

No records.

MULBERRY.

LEAF SPOT (Cercospora moricola) was widespread in its occurrence, very heavy infections occurring in many instances.

BACTERIAL BLIGHT (Pseudomonas mori). The incidence of this disease was slight but in a few cases recorded infection was usually severe.

PERSIMMON.

LEAF SPOT (Gloeosporium diospyri) was common at Lisarow this year, causing defoliation and loss of fruit, starting from the lower limbs.

STRAWBERRY.

CRINKLE (virus) continues to be a limiting factor in strawberry production in N.S.W.

In yield trials of crinkle-infected and crinkle-free strawberries, the healthy plants commenced to crop earlier and at first produced yields more than twice as great as those of the infected plants. Crinkle spread throughout all plots during the fruiting season and rate of yield evened up.

WALNUT.

BACTERIAL BLIGHT (Xanthomonas juglandis) was reported from Wandsworth and Arding.

ORNAMENTALS.

GENERAL.

Weather conditions during late summer and autumn were warm and wet on the coast. Consequently, losses due to damping-off of seedlings were unusually high. Amongst the crops particularly affected were iceland poppies, marigold, antirrhinum, aster, pansy, dianthus, sweet william, stock.

ANTIRRHINUM.

ANTHRACNOSE (Colletotrichum antirrhini). Following rains in February and April, anthracnose developed in all parts of the Metropolitan area. Seedlings and established plants were affected and where no spraying was done losses were heavy.

COLLAR ROTS. Rhizoctonia solani was responsible for considerable loss in a commercial crop at Liverpool following warm showery weather. Phytophthora cinnamomi and P. cryptogea were recorded from a number of commercial crops and home gardens in the Metropolitan area during late spring and autumn. Sclerotium rolfsii was active during summer and early autumn.

ROOT KNOT (Heterodera marioni) was as usual, recorded from a number of localities. This crop appears to be particularly susceptible to root knot.

GREENING (virus) was recorded in home gardens at Griffith and Condobolin.

APPLE (FLOWERING).

POWDERY MILDEW (Podosphaera leucotricha) caused considerable damage to trees at Orange.

AQUILEGIA.

POWDERY MILDEW (Erysiphe polygoni) was recorded from a number of Metropolitan localities.

COLLAR ROT (Sclerotium rolfsii) was widespread during late summer and autumn.

ASTER.

WILT (Fusarium callistephi) caused losses of 5 to 10% in crops of American Beauty at Widemere and St. John's Park.

COLLAR ROT (Phytophthora sp.) caused heavy losses in early autumn crops at St. Ives, Bankstown and Panania.

SPOTTED WILT (virus) was observed causing losses of 5 to 25% in crops at Wyong, St. Ives, Carlingford and Mt. Colah.

GREENING (virus) was recorded in commercial crops at Liverpool and St. Ives. Infection continued to take place throughout the season.

AZALEA.

DIE BACK (cause not known) was recorded from a number of localities.

BERBERIS.

ROOT ROT and SHOOT BLIGHT (Phytophthora parasitica) was recorded for the first time on this host from a Metropolitan nursery following heavy rain in February.

BRACHYCHITON ACERIFOLIA.

ROOT ROT and SHOOT BLIGHT (Phytophthora parasitica) was recorded for the first time on this host from a Metropolitan nursery, following rain in February.

CALENDULA.

RUST (Puccinia calendulae). As usual, rust was widespread in coastal and Tableland areas throughout the year.

LEAF SPOT (Entyloma calendulae) was recorded from Albury and the Metropolitan area.

CALLA.

SOFT ROT (Bacterium carotovorum) caused about 10% loss in a commercial crop at Wentworthville.

CAMELLIA.

BUD DROP (nutritional) appears to have been more prevalent than usual in coastal districts.

CARNATION.

COLLAR ROTS and WILTS. Sclerotium rolfsii was particularly active during summer and autumn, and losses of from 10% to 70% were reported from many localities in the Central and South Coast. Rhizoctonia solani was favoured by warm wet conditions and numerous reports were received from coastal growers. Its period of activity overlapped that of Sclerotium rolfsii and continued until the end of autumn. Fusarium sp. was recorded from several Metropolitan localities. It appears to be serious only in fairly light sandy soils. Phytophthora sp. was recorded for the first time on this host, causing about 10% loss in a crop on rather heavy, ill-drained soil at Wentworthville following excessive rains in early autumn.

MOSAIC (virus). All commercial varieties grown in N.S.W. are believed to be infected with mosaic. There is reason to suspect that virus infection is responsible for the deterioration always found when a new variety comes into general cultivation. Seedling selections of excellent vigour and quality have been found to lose their outstanding characters when infected with mosaic.

LEAF SPOT (Septoria dianthi) and RUST (Uromyces caryophyllinus) were prevalent during late summer and autumn.

ROOT KNOT (Heterodera marioni) was recorded from a large number of localities. Carnations appear to be extremely susceptible to this disease, and when infected badly are stunted and produce few, poor blooms.

ALTERNARIA LEAF SPOT (Alternaria sp.) caused considerable damage to young and old leaves in commercial crops at Penrith and Engadine.

CEANOTHUS EDWARDSII.

COLLAR ROT (Phytophthora sp.) was recorded for the first time on this host from a Metropolitan garden.

CHAMAELAUCIUM UNCINATUM.

ROOT ROT (Armillaria mellea) was recorded for the first time on this host from a Gosford nursery.

COLLAR ROT (Phytophthora cinnamomi) was recorded for the first time on this host from a Metropolitan nursery.

CHESTNUT (Castanea).

ROOT ROT and SHOOT BLIGHT (Phytophthora cinnamomi) was recorded for the first time on this host from a Metropolitan nursery following excessive rain in February.

CHRYSANTHEMUM.

FOLIAR NEMATODE (Aphelenchoides ritzema bosi). Though recorded for the first time in 1930, this disease has been to date of minor importance, a few isolated outbreaks only being recorded. This year outbreaks occurred following late summer rains in all chrysanthemum growing districts, and caused total loss of some varieties and very considerable losses in others. Much varietal difference in susceptibility was observed. The disease was probably favoured by wet conditions during autumn.

Soil treatment with 25 ppm. sodium selenate eliminated infestation in glasshouse trials.

LEAF SPOT (Cylindrosporium chrysanthemi) and RUST (Puccinia chrysanthemi) were very prevalent during the autumn in coastal and Tableland districts and caused some loss.

WILT (Verticillium dahliae) was recorded from localities in the Metropolitan area and from Kyogle.

DAFFODIL.

BASAL ROT (Fusarium bulbigenum) was unusually prevalent in Metropolitan and Mountain crops, particularly in badly drained soil. Losses of 2% to 60% were recorded.

DAHLIA.

POWDERY MILDEW (Oidium sp.). An unusually heavy development occurred in the autumn in Coast and Tableland crops. Mostly the disease did not reach serious proportions until towards the end of the flowering season.

LEAF SPOT (Entyloma dahliae) was observed causing considerable leaf injury, in the St. Ives, Terry Hills districts.

SPOTTED WILT (virus) was prevalent, as usual.

SCLEROTINIA ROT (Sclerotinia sclerotiorum) was responsible for losses during storage at St. Ives during winter 1946. Following wet weather in May 1947, many plants became infected before they had died down naturally and considerable extension of the disease is to be anticipated during storage.

COLLAR ROT (Sclerotium rolfsii) was recorded from Kyogle.

STREAK (? virus), a condition which appears to be due to virus infection, was observed in several St. Ives nurseries. A few varieties only showed the disease, symptoms took the form of black streaks in the stem tissue.

DAPHNE.

COLLAR ROT (Phytophthora parasitica and Sclerotium rolfsii) was very prevalent in nurseries and private gardens following autumn rains.

DIOSMA.

ROOT ROT (Phytophthora parasitica) was recorded for the first time on this host from a Metropolitan nursery, following autumn rains.

ERICA spp.

ROOT ROT (Phytophthora cinnamomi) was recorded for the first time on this host from a Metropolitan nursery, following autumn rains.

EUONYMUS OVATUS AUREUS.

POWDERY MILDEW (Oidium sp.) was recorded for the first time on this host from a Metropolitan locality.

FRANGIPANNI.

DIE-BACK (Fusarium sp.) recorded at Wyong.

POWDERY MILDEW (Oidium sp.) recorded for the first time on this host, causing some leaf distortion, from a Metropolitan garden.

FREESIA.

SCAB (Pseudomonas marginata) and CORM ROT (Fusarium sp.) caused total loss of a small crop in the Metropolitan area.

GARDENIA.

BUD DROP (nutritional) was very prevalent in the Central Coast.

LEAF YELLOWING (suspected potash deficiency) was observed during spring and autumn in a number of Metropolitan localities.

ROOT KNOT (Heterodera marioni) was found to be the cause of deterioration of vigour in a number of cases investigated. This crop appears to be very susceptible to root knot infection.

GERANIUM.

RUST (Puccinia pelargonii zonalis) was prevalent as usual during autumn.

GERBERA.

LEAF SPOTS (Cercospora sp. and Septoria sp.) were prevalent during late summer and autumn.

COLLAR ROT (Phytophthora parasitica) was again recorded from a number of localities. Activity commenced in early December.

GLADIOLUS.

NECK ROT and DRY ROT (Sclerotinia gladioli) was reported from all parts of the State, losses ranging from 2% to 85%. It

was particularly severe in a late autumn crop maturing under wet conditions at Robertson. Treatment of bulbs with 1:250 of 2½% emulsion of phenyl mercuric acetate for 48 hours gave complete control of this disease.

SCAB (Pseudomonas marginata) was more prevalent than for some years, especially on corms dug after the onset of wet weather in February.

HARD ROT (Septoria gladioli) caused storage losses at Cabramatta, St. Ives, Carlingford, North Ryde and Berry.

CORE ROT (Botrytis cinerea) was recorded from Richmond, Mt. Wilson, Robertson and St. Ives. Considerable foliage infection took place in late autumn crops, following rain. Heavy storage losses are to be anticipated where control measures are not adopted.

MOSAIC (virus) was recorded from Dundas.

PENICILLIUM ROT (Penicillium gladioli) was recorded from Bonnyrig, Robertson, Wyong and St. Ives, but caused negligible damage.

FUSARIUM CORM ROT (Fusarium sp.) was of minor importance.

HOLLYHOCK.

RUST (Puccinia malvacearum) was prevalent as usual.

HYACINTH.

EELWORM (Anguillulina dipsaci) was recorded from a Metropolitan locality.

SOFT ROT (Bacterium carotovorum) has resulted in the total loss of a commercial crop at Mt. Wilson over a period of several years.

GREY MOULD (Botrytis cinerea) caused some moulding of leaf tips and flowers in a Metropolitan crop.

HYDRANGEA.

POWDERY MILDEW (Oidium sp.) was general in spring and autumn.

GREENING (virus) was recorded from Wollongong.

IPOMOPSIS.

COLLAR ROT (Rhizoctonia solani) was recorded causing losses of 25 to 30% in commercial crops at Avoca and Mt. Colah.

IRIS GERMANICA.

LEAF SPOT (Heterosporium gracile) caused considerable blighting of the foliage of some varieties in private gardens during late autumn.

JACARANDA.

COLLAR ROT (Phytophthora cinnamomi) was recorded for the first time on this host in a Metropolitan nursery during warm wet weather in February.

LAGERSTROEMIA.

POWDERY MILDEW (Uncinula australiana) was prevalent during late spring.

LILAC.

ROOT ROT (Phytophthora parasitica) was recorded for the first time on this host from a Leeton garden.

LILIUM.

BULB ROT (Sclerotium rolfsii) affected L. dauricum and L. speciosum in Metropolitan gardens.

MOSAIC (virus) was general as usual.

LUCULIA.

CROWN ROT (? Phytophthora sp.) was prevalent in Metropolitan gardens following autumn rains.

LUPIN.

COLLAR ROT (Rhizoctonia solani) was recorded from a Metropolitan crop.

MARIGOLD.

SPOTTED WILT (virus) caused small losses in commercial crops at Carlingford and Blacktown.

MICHAELMAS DAISY.

POWDERY MILDEW (Oidium sp.) was prevalent in Metropolitan gardens.

MIGNONETTE.

MOSAIC (? cucumber mosaic). About 80% of a commercial crop at Wyong was affected. Shoots were blighted and later growth distorted, the veins knotted and cleared and the flowers showed a tendency to greening, or failed to develop.

LEAF SPOT (Cercospora resedae) was recorded in a Carlingford crop during the autumn. Damage was slight.

PHLOX (perennial).

GREENING (virus) was recorded from Jingellic and the Metropolitan area.

PISTACIA CHINENSIS.

ROOT ROT (Phytophthora cactorum) was recorded for the first time on this host from a Metropolitan nursery.

POPLAR (CAROLINA).

DIEBACK (Cytospora chrysosperma). Street trees in the Leeton district growing under rather poor conditions, were found to be affected with this disease.

POPPY (ICELAND).

SPOTTED WILT (virus) caused slight losses in early crops at Bankstown and St. Ives.

CROWN ROT (? Phytophthora sp.). Early sown poppies planted out during the wet weather of early autumn suffered severely from crown rot in the St. Ives, Mt. Colah and Bankstown districts.

DOWNY MILDEW (Peronospora arborescens) was recorded from Gordon.

WILT (Verticillium dahliae) was recorded for the first time on this host in the Metropolitan area.

PRIMULA.

COLLAR ROT (Phytophthora sp.) was recorded from the Metropolitan area.

PROSANTHERA.

COLLAR ROT (Sclerotium rolfsii) was recorded for the first time on this host in the Metropolitan area.

STEM GIRDLE (Phoma sp.) was recorded from a Metropolitan nursery following a period of wet weather.

RANUNCULUS.

MOSAIC (virus) was prevalent as usual.

RAPHIOLEPIS INDICA.

FRECKLE (Fabraea maculata) was recorded for the first time on this host at Dural, causing defoliation and dieback.

ROSE.

POWDERY MILDEW (Sphaerotheca pannosa) was general on Coast and Highlands from early summer onwards.

BLACK SPOT (Diplocarpon rosae). Following early autumn rains, considerable black spot development took place on Coast and Highlands and early defoliation resulted.

ANTHRACNOSE (Sphaceloma rosarum) was recorded from several nurseries.

DIEBACK (? virus) was observed in early spring in the Metropolitan area and Coonabarabran. A die-back which may be due to fungus infection is under investigation in the Metropolitan area.

SALT INJURY was observed at Narromine.

SAPIUM SEBIFERUM (Chinese tallow).

POWDERY MILDEW (Oidium sp.) was recorded for the first time on this host from a Metropolitan garden.

STATICE SINUATA.

CROWN ROTS (Phytophthora sp. and Sclerotium rolfsii) were recorded for the first time on this host from Wyong, following warm wet weather.

LEAF SPOT (Cercospora sp.) was recorded at Wyong and Carlingford causing negligible damage.

STERCULIA DIVERSIFOLIA (Kurrajong).

ROOT ROT (Phytophthora sp.) was recorded from the Murrumbidgee Irrigation Areas and Gunnedah.

COLLAR ROT (Sclerotinia minor) caused mortality among year-old seedlings at Tamworth (first record on this host).

STOCK.

BLACK ROT (Xanthomonas incanae). Warm wet conditions during autumn were very conducive to the development of this disease, and combined with Pythium root rot, it resulted in an almost complete failure of early planted stock in all parts of the State.

ROOT ROT (Pythium sp.) was widespread and destructive, especially in heavy soils following autumn rains.

MOSAIC (virus). During the winter of 1946, stock mosaic was very prevalent in Metropolitan and country crops. Reports were received from all parts of the State.

SCLEROTIUM ROT (Sclerotinia sclerotiorum) was recorded causing losses at Dundas and Blacktown.

GREENING (virus) was recorded from Griffith.

COLLAR ROT (Rhizoctonia solani) was recorded from a number of localities.

SWEET PEA.

ROOT ROT (Pythium sp., Fusarium sp., Rhizoctonia solani) was very prevalent and caused much damage in Central and South Coast districts, particularly in early crops. Early autumn rains and warm conditions during the autumn appear to have favoured the disease. Crops in rather heavy, poorly drained soils were most seriously affected. Plants show symptoms at all stages of growth.

BUD DROP (excessive nitrogen). Many reports were received from all districts of bud drop, particularly in early crops.

POWDERY MILDEW (Erysiphe polygoni) was reported from Penrith, Kellyville and St. Ives.

SCLEROTINIA ROT (Sclerotinia sclerotiorum) was recorded for the first time on this host from Blacktown.

SPOTTED WILT (Virus) was recorded causing slight damage to early crops in several districts.

GHOST SPOT (Botrytis cinerea) caused considerable damage to a flower crop at Smithfield. Symptoms took the form of rings or concentric rings of bleached tissue in the petals. The outbreak followed a period of damp cool weather.

SWEET WILLIAM.

COLLAR ROT (Rhizoctonia solani) was recorded from Warren.

TULIP.

FIRE (Botrytis tulipae) was recorded causing a minor amount of leaf injury to a crop in the Robertson district. This is a first record.

VERBENA.

POWDERY MILDEW (Erysiphe cichoracearum) was recorded from a seed crop at Dundas. It was also prevalent in Metropolitan gardens.

VIRGILIA CAPENSIS.

ROOT ROT (Armillaria mellea) was recorded for the first time on this host from a Metropolitan garden.

VIOLET.

SCAB (Sphaceloma violae). A very bad outbreak of scab occurred in Metropolitan crops, following early autumn rains. One case of flower infection was observed.

WALLFLOWER.

BLACK ROT (? Xanthomonas incanae) was responsible for the total loss of a crop at St. Ives. Seed had been saved from an apparently healthy crop. The disease had shown up first in the seed bed. Symptoms resemble those of stock black rot.

DOWNY MILDEW (Peronospora sp.) was recorded on seedlings at Epping.

ZINNIA.

POWDERY MILDEW (Oidium sp.) was very general towards the end of the flowering season.

COLLAR ROT (Rhizoctonia solani) was recorded from a number of localities during early autumn.

SPOTTED WILT (virus) caused moderate losses in Carlingford district and in home gardens in the Metropolitan area.

LEAF SPOT (Alternaria sp.) was prevalent towards the end of the flowering season at St. Ives and Mt. Colah. It caused negligible damage.

VEGETABLES.

BEAN.

BACTERIAL DISEASES. HALO BLIGHT (Pseudomonas medicaginis var. phaseolicola) was of less importance than in preceding years, mainly as a result of the improvement of the seed supply brought about by a scheme of seed certification. In thorough certification inspections of about 650 acres of bean seed crops on the South Coast grown from certified seed, only 14 patches of halo blight, representing from one to about 30 infected plants for each patch when found, were located. This represents one originally infected plant in about each 40 acres or about one infected seed in each two million. In seed crops grown from uncertified seed, two cases of severe infection were recorded - in crops of Canadian Wonder and Startler Wax. There were several records of the disease in green bean crops, but no reports of severe crop losses. AMERICAN COMMON BLIGHT (Xanthomonas phaseoli) was found only in the variety Epicure in the case of seed crops of French beans. It was recorded during the past year, however, on green bean crops of the variety Brown Beauty. BACTERIAL BROWN SPOT (Pseudomonas syringae) was recorded in several instances during the past season, but the disease was less in evidence than during the two previous seasons.

The seed certification scheme was continued for the fourth successive year. A total of 964 acres (194 separate crops) were inspected and 545 acres (114 crops) were passed for certification. It is expected that about 6,500 bushels of seed will be certified. Of this quantity about 65% will be Brown Beauty, 23% Hawkesbury Wonder and the remaining 12% will comprise the varieties Tweed Wonder, Wellington Wonder, Canadian Wonder and Landreth Stringless Greenpod. After necessary reservations have been made of seed required for next season's seed crops, over 5,000 bushels of certified seed will be available for green bean growers.

MOSAIC (virus) was present in all crops. The "yellow dwarf" type of mosaic was again of importance in crops of Tweed Wonder and Canadian Wonder, where infection of the order of 10 to 15% was observed in many crops. Thorough roguing carried out by several growers during the past season, of seed crops of these two varieties will, it is hoped, keep this yellow dwarf mosaic at a low level.

ASHY STEM BLIGHT (Macrophomina phaseoli) was recorded from Moruya (South Coast) and from Leeton (Murrumbidgee Irrigation Area).

SCLEROTINIA ROT (Sclerotinia sclerotiorum) was responsible for heavy losses in beans forwarded to the Sydney Municipal Markets from the Central and North Coast during the autumn and early winter months of 1947. Many consignments of beans were quite unsaleable when received in Sydney because the fungus had, during transit to market, spread right throughout whole bags or boxes of beans.

RHIZOCTONIA ROOT ROT (Rhizoctonia solani). Several records were made during the year.

FUSARIUM ROOT ROTS and WILTS (Fusarium spp.) These diseases were less in evidence than during the preceding year, mainly, it is thought, because the susceptible strains of Canadian Wonder are being replaced with the strains of this variety showing a higher degree of resistance.

ROOT KNOT (Heterodera marioni). This disease was of common occurrence without causing serious losses.

STEM EELWORM (Ditylenchus dipsaci). No cases of infection with stem eelworm were recorded during the past year, although several inspections were carried out of bean crops planted on the four farms at Matcham (Gosford district, Central Coast) where the disease had been observed previously. It is not certain, however, that the disease has completely disappeared from these farms.

RUST (Uromyces phaseoli typica), was recorded on many crops of Epicure beans, including two seed crops of this variety grown on the South Coast.

ANGULAR LEAF SPOT (Isariopsis griseola) was again of common occurrence. In South Coast seed crops this disease was present in almost all crops towards the end of the season, in some cases being responsible for considerable leaf damage. There was one field observation indicating that the disease is carried over from one season to the next in the soil.

ANTHRACNOSE (Colletotrichum lindemuthianum). There were several records of anthracnose during the year. The only cases in which this disease was found on seed crops were four crops of Canadian Wonder (trace infection only) and three crops of Startler Wax.

ALTERNARIA SPOT (Alternaria sp.) was again of common occurrence in South Coast seed crops on the older leaves.

PYTHIUM STEM ROT (Pythium aphanidermatum) was recorded from the Murrumbidgee Irrigation Area.

PHYSIOLOGICAL BREAKDOWN (?) (Non-parasitic). A condition resembling that described in the United States as "physiological breakdown" was recorded several times during the past year on green beans received at the Sydney Municipal Markets. In every case the beans had been grown on the far North Coast or in Queensland, and there were no records of the condition in the case of beans received from Gosford or other sections of the Central Coast.

BROAD BEAN.

SPOTTED WILT (virus) was common in the Sydney Metropolitan area.

CHOCOLATE SPOT (Botrytis sp.) was recorded during the autumn of 1947 but there were no records during the dry spring season of 1946.

DAMPING-OFF and ROOT ROT. Several records. Various fungi found associated with this condition in the several specimens examined. However, the cause of the disease was most commonly Rhizoctonia solani.

NAVY (FIELD) BEANS.

AMERICAN COMMON BLIGHT (Xanthomonas phaseoli) was again widespread and responsible for crop losses in Northern Tablelands crops of navy beans. During the past year the project of building up supplies of navy bean seed free from this and other serious seed borne diseases was commenced.

RUST (Uromyces phaseoli typica). There was one record on navy beans during the past year - from Bega.

BEET AND SILVER BEET.

CERCOSPORA LEAF SPOT (Cercospora beticola) was again of widespread occurrence, especially on silver beet crops in the Sydney Metropolitan Area.

DAMPING-OFF and WILT (Aphanomyces sp.). This disease occurred as in previous seasons, in various parts of the Sydney Metropolitan area, mainly on table beet.

ROOT KNOT (Heterodera marioni). There were several records from various parts of the State.

CAPE GOOSEBERRY.

ROOT KNOT (Heterodera marioni) was recorded in the Sydney Metropolitan area.

ROOT ROT (Fusarium sp.) was recorded from the Sydney Metropolitan area.

WHITE SMUT (Entyloma sp.) was recorded, for the first time, in this State, in the Sydney Metropolitan area.

CARROT.

LEAF BLIGHT (Macrosporium carotae) was recorded as causing severe defoliation of carrot crops in the Gosford district. The two varieties Chantenay and Osborne Park appeared to be equally susceptible.

CELERY.

LATE BLIGHT (Septoria apii-graveolentis). This disease was widely distributed and caused serious damage in some cases.

BACTERIAL SOFT ROT (Bacterium carotovorum). Several records were made of bacterial soft rot on celery, severe rotting being reported in two cases where the plants had first been affected with late blight, the latter having apparently paved the way for the soft rot bacteria.

PITHINESS and HOLLOW STEM (non-parasitic). This condition was recorded from the Murrumbidgee Irrigation Areas and was thought to be due to a sudden check in growth following frosts in the autumn of 1947.

CRUCIFERAE.

BLACK ROT (Xanthomonas campestris). There have been several records on cauliflower and on cabbage, mainly the former. Reports from the Bathurst district indicated that although the disease was present in that area during the autumn months of 1947, its incidence was much less than in the previous year. It is known that during the past season many growers treated their seed in hot water and this was probably responsible for the lesser amount of disease.

SCLEROTINIA ROT (Sclerotinia sclerotiorum) was frequently observed in the Sydney Metropolitan area.

WHIPTAIL (non-parasitic) was of common occurrence on cauliflower.

DAMPING-OFF and WIRE STEM (Rhizoctonia solani). There were several records of this disease.

CLUB ROOT (Plasmodiophora brassicae) occurred in several crops in the Sydney Metropolitan area.

RING SPOT (Mycosphaerella brassicicola). This disease was recorded on cabbages from the Moss Vale (Southern Tablelands) district where it was responsible for a considerable amount of spotting on the older leaves.

ALTERNARIA SPOT (Alternaria brassicae) was recorded from the Sydney Metropolitan area and from the Bathurst district.

DOWNY MILDEW (Peronospora parasitica) was usually present on cauliflower and cabbage crops, though damage was negligible.

BLACK LEG (Phoma lingam). There was one record of this disease in cabbage from the Bathurst district.

MOSAIC (virus) was recorded on cabbage from the Bathurst district and from the Sydney Metropolitan area.

BROWN HEART (boron deficiency). There was only one record of boron deficiency in swede turnips during the past year. The crop was grown in the Moss Vale district.

SUCKERING and LEAF FORMATION IN CAULIFLOWER CURDS (non-parasitic). During the autumn months of 1947 there were several reports from the Bathurst district of cauliflowers producing an excessive amount of leaf tissue in the curds. There were also reports of the production of side shoots (suckers) from the main stem between the leaf axils. It is not known whether these abnormalities resulted from peculiar seasonal conditions or from the use of seed of poor genetic quality.

POTASH DEFICIENCY (non-parasitic) was recorded on cabbages in the Sydney Metropolitan area.

CUCURBITS.

POWDERY MILDEW (Erysiphe cichoracearum) was, as usual, of widespread occurrence in pumpkin, marrow, squash, rockmelon and cucumber crops. A first record of this disease on watermelon was made on a specimen submitted from Yamba (North Coast).

DOWNY MILDEW (Peronoplasmopara cubensis). There were several records of this disease on cucumbers, rockmelons and gherkins. Cucumber and rockmelon seed crops in the Moruya and Bodalla (South Coast) area were again severely affected. It was observed that even one spraying with a copper spray gave appreciable control of downy mildew.

FUSARIUM ROOT ROT (Fusarium sp.). A root rot and wilt disease was recorded on pumpkins and marrows grown at Mt. George (Central North Coast). A species of Fusarium was isolated and shown to be pathogenic to all cucurbits tested (pumpkin, squash, marrow, rockmelon, cucumber and watermelon).

FAILURE TO SET FRUITS (non-parasitic). Fruit failed to set in several instances, especially in the case of pumpkins.

LETTUCE.

SPOTTED WILT (virus). There were many records of Spotted Wilt from the Sydney Metropolitan area, especially during October and November 1946, when losses of the order of 30% and more were sustained by many commercial growers.

SEPTORIA SPOT (Septoria lactucae). There were three records of this disease during the year; two were from the Gosford (Central Coast) district and the other from the Sydney Metropolitan area. Very severe infection, resulting in stunting of the plants, was reported in the case of one of the affected crops in the Gosford district.

DOWNY MILDEW (Bremia lactucae) was widely distributed, but in only one case was this disease reported as attacking the inner heart leaves. In other cases infection was confined to the outer leaves.

BIG VEIN (virus). A condition resembling that known in the United States as Big Vein was recorded from several market gardens in the Sydney Metropolitan area. In one case infection of the order of 20-25% was observed over an area of about an acre, affected plants being definitely stunted in comparison with unaffected plants.

TIP BURN and BACTERIAL SOFT ROT. There were several records of these troubles in association.

MUSHROOM.

BUBBLES (?) (Mycogone sp.). A species of Mycogone was isolated in October 1946 from cultivated mushrooms showing rotting and grown at St. Marys (30 miles west of Sydney). Symptoms of the disease, however, were not quite typical of those described overseas for the bubbles disease (Mycogone perniciosa).

VERTICILLIUM SPOT (Verticillium sp.) was recorded on one crop.

WEED FUNGI OF MUSHROOM BEDS. There were two records of white plaster mould (Monilia fimicola) and one record of Clitopilus cretatus.

ONION.

DAMPING OFF (Rhizoctonia solani) was recorded on onion seedlings from the Sydney Metropolitan area.

PARSLEY.

No records.

PARSNIP.

ROOT KNOT (Heterodera marioni) was recorded from the Sydney Municipal area.

RHIZOPUS SOFT ROT (Rhizopus nigricans) was recorded on parsnips received at the Sydney Municipal markets from Victoria.

PEA.

POD and LEAF SPOT DISEASES (Mycosphaerella pinodes and Ascochyta pisi) were recorded on several occasions during the year. Dry conditions during the late winter and spring months of 1946, however, largely prevented the development and spread of these diseases in pea crops in the Gosford district and other parts of the Central Coast.

POWDERY MILDEW (Erysiphe polygoni). There were several records from coastal districts.

FUSARIUM ROOT ROT and WILT (Fusarium sp.) was recorded from the Gosford district and from Gunnedah and Harden. It was also observed in peas grown at the Bathurst Experiment Farm.

BACTERIAL BLIGHT (Pseudomonas pisi). There was only one record during the past year - from Glen Innes (Northern Tablelands).

SEPTORIA SPOT (Septoria pisi) was recorded from the Gosford district.

ANTHRACNOSE (Colletotrichum pisi). There was one record from the Gosford district.

POTATOES.

LEAF ROLL, MOSAIC and WITCHES BROOM (virus) were as usual, of widespread occurrence, but the potato certification scheme continues to give effective control of these diseases.

SPOTTED WILT (virus) occurred in epiphytotic proportions in sections of the Southern Tablelands and Central Tablelands, but was practically absent from the Northern Tablelands potato growing areas. On the Southern Tablelands 787 acres were rejected for certification because of the presence of spotted wilt. This represented 27% of the total crops submitted for certification. In the Orange-Millthorpe-Blayney district, 541 acres, representing 96% of the total area submitted for certification from that section of the Central Tablelands, were rejected because of the presence of spotted wilt. Some potato crops grown on the Central Tablelands showed infection with spotted wilt of the order of 50 to 100%. Spotted wilt has so far been of relatively little importance in the following Tableland areas:- Batlow and Canberra-Queanbeyan sections of the Southern Tablelands, the Oberon section of the Central Tablelands and all the Northern Tablelands potato growing areas.

COMMON SCAB (Actinomyces scabies) and RHIZOCTONIA DISEASE (Rhizoctonia solani) were again widespread.

FUSARIUM WILTS and TUBER ROTS (Fusarium spp.) were recorded on several occasions.

TARGET SPOT (Alternaria solani). This disease was reported as occurring in all potato crops grown on the Northern Tablelands during the past year, especially in the case of midseason and late plantings in which the disease was in many cases responsible for severe defoliation.

LATE BLIGHT (Phytophthora infestans) was recorded from the Sydney Metropolitan area during the winter of 1946 and again during the autumn months of 1947. Dry conditions during the late winter and spring months of 1946 were unfavourable for the development of this disease.

EELWORM (Heterodera marioni) was present in several crops.

SILVER SCURF (Spondylocladium atrovirens). There was one record during the past year - from the Sydney Metropolitan area.

STEM-END BROWNING (non-parasitic). A stem end browning condition with which no parasitic micro-organism appeared to be associated was recorded on tubers of the Sequoi variety from Millthorpe (Central Tablelands).

RHUBARB.

DOWNY MILDEW (Peronospora jaapiana). There were several records of this disease.

PHYLLOSTICTA LEAF SPOT (Phyllosticta straminella) was recorded from the Sydney Metropolitan area.

SWEET POTATO.

EELWORM (Heterodera marioni) was recorded on sweet potatoes from the far North Coast, causing considerable injury to the outer tissue of mature roots. This was the first record of attack of sweet potatoes in N.S.W.

SCURF (Monilochaetes infuscans). There was one record from the far North Coast during the past year.

TOMATO.

SPOTTED WILT (virus). Incidence of this disease was higher than for many seasons, numerous crops in the Sydney Metropolitan area being completely destroyed during spring and early summer. Approximately 60 per cent. of tomato plants in the Murrumbidgee Irrigation Areas were observed to be infected in January; however, destruction of affected plants was not complete in many cases.

Infection was heavier in early autumn crops than is usually the case.

Weekly application of tartar emetic-sugar spray again showed some control in the city of Sydney; in one experiment unsprayed plots exhibited 77 per cent. infection and sprayed plots 37 per cent. infection.

EARLY BLIGHT (Alternaria solani) was present in all commercial midseason and late crops in coastal districts. Growers using 1-1-40 Bordeaux Mixture followed by 4-4-40 Bordeaux Mixture after fruit set obtained only partial control. Unsprayed crops were seriously defoliated. Calyx end infection of the fruit was noted in many crops, while at Wedderburn and Gosford infection of leaf stalks, sometimes spreading to the main stem, caused a small percentage of losses. Copper sprays gave best control on well fertilized, vigorously growing plants.

FUSARIUM WILT (Fusarium oxysporum f. lycopersici) occurred throughout the State though losses due to this disease were at a lower level than last year. Both field and glasshouse (steam "sterilized" soil) crops were affected. In one instance numerous

plants in a small plot of the recently introduced variety Sioux were destroyed by this disease. Fusarium wilt was of very minor importance in large plantings of tomatoes grown for canning purposes in the Murrumbidgee Irrigation Areas.

BACTERIAL CANKER (Corynebacterium michiganense). The most serious outbreak of this disease for several years occurred this season. In contrast with last year when records of the disease were extremely few, specimens affected by bacterial canker were received from practically every tomato growing district of the State. Attempts to determine the reason for the flare-up were unsuccessful, as seed history and crop rotation were apparently satisfactory in most cases. The most extensive outbreak was in the Murrumbidgee Areas where the "birds eye" symptom was particularly prevalent on fruit following December rains. A similar outbreak occurred on one property at Windsor.

BACTERIAL SPOT (Xanthomonas vesicatoria) was observed in most coastal and some inland districts. It was present in one inland crop grown for seed purposes and indications are that one line of Break o' Day seed sown in the Gosford area was infected. In general, damage was slight.

LEAF MOULD (Cladosporium fulvum). All glasshouse crops were attacked by this disease to at least a moderate extent; no spraying being carried out as the result of the non-availability of sprays having a salycilanilide base. This season's crop, at present setting the second or third fruit truss, are already showing some lesions.

Autumn outdoor crops in some cases have been heavily attacked, though most crops are free from the disease.

ROOT KNOT (Heterodera marioni) was prevalent in most glasshouse crops and many outdoor crops. No serious effects were observed. Root knots have been noted on young seedlings grown in steam sterilized soil in glasshouses. The soil is sandy and deep and probably permits penetration of the nematode to depths beyond the area affected by the spiked steam harrows used for "sterilization".

BACTERIAL WILT (Bacterium solanacearum). No plant affected by this disease was examined during the year.

SEPTORIA LEAF SPOT (Septoria lycopersici). Reports were again confined to coastal districts. Seedling attack was recorded at Gosford in December. In general, this disease caused no serious damage.

BLOSSOM DROP (non-parasitic) was of no importance.

MAGNESIUM DEFICIENCY. Some improvement in plant appearance appears to have resulted from the application of 10 lbs. of magnesium sulphate to the soil of standard glasshouses (90 feet x 15 feet) in the Sydney Metropolitan area. Deficiency symptoms were observed on determinate varieties and not on other types in small plots at the Bathurst Experiment Farm.

VERTICILLIUM WILT (Verticillium dahliae). No records even from autumn and winter grown glasshouse crops.

FRUIT ROTS.

Colletotrichum phomoides caused some losses in outdoor grown fruit picked in the autumn and stored, in bulk, under bagging to accelerate ripening.

Rhizopus sp. caused minor losses during transport of North Coast grown fruit to Sydney markets.

Oidium lactis f. parasitica was recorded for the first time in rotted fruit inspected at the Markets.

Rhizoctonia solani and Phytophthora sp. caused field rotting of ripening fruit which was in contact with the ground during wet weather at Gosford in February.

RHIZOCTONIA ROOT ROT (Rhizoctonia solani). Warm weather conditions resulted in seedling losses. Some affected plants, transplanted at a depth calculated to permit the development of adventitious roots, exhibited symptoms macroscopically very similar to bacterial canker. The fungus extended vertically through the pith causing stunting of the plants, wilting and one-sided development, together with canker formation. The pith was stained cream to rust and extensive collapse occurred in the region of the nodes.

BIG BUD (virus). Specimens affected by Big Bud were received chiefly from inland districts and the Richmond-Windsor area. No serious losses occurred.

MOSAIC (virus). Outdoor crops were practically free of the disease which occurred in about 20 per cent. of glasshouse crops. The most common strain appears to be benign on the varieties (Chinese Red types) grown under glass and is largely masked if temperatures are satisfactory for uninterrupted growth of the plants.

TWO VIRUS STREAK (virus). No records.

BLOSSOM END ROT (non-parasitic) was prevalent due to the unsatisfactory weather conditions. San Marzana was the most seriously affected variety, though globe types were also affected.

SUNSCALD (non-parasitic) was prevalent in many areas, especially in the Murrumbidgee Irrigation Areas on San Marzana.

MISCELLANEOUS PLANTS.

ACACIA PODALYRIAEFOLIA (Queensland Wattle).

COLLAR ROT (Phytophthora sp.) was recorded for the first time on this host in the Metropolitan area.

BLACKBERRY (Rubus fruticosus).

RUST (Kuehneola uredinis) was widespread in the Tenterfield district and in coastal areas.

CHENOPODIUM ALBUM.

DOWNY MILDEW (Peronospora sp.) was recorded from a number of districts.

EPILOBIUM GLABELLUM.

RUST (Puccinia epilobii - tetragoni) was recorded causing much injury in the Gosford district.

ERIOSTEMON LANCEOLATA.

COLLAR ROT (Phytophthora cinnamomi) was recorded for the first time on this host in virgin bushland at Kuring-gai Chase.

EUCALYPTUS MICRANTHA.

LEAF SCORCH (Mycosphaerella sp.). Blighting of young foliage was noted at Dural.

MALVA.

RUST (Puccinia malvacearum) was very general.

NETTLE (Urtica urens).

LEAF SPOT (Septoria sp.) was noted in several green crops in citrus orchards at Leeton. Plants in shaded positions were killed back.

OXALIS.

POWDERY MILDEW (Oidium sp.) was recorded for the first time on this host from Sydney.

ROOT KNOT (Heterodera marioni) was recorded for the first time on O. purpurata in the Metropolitan area.

PEPPER TREE (Schinus molle).

SEEDLING ANTHRACNOSE (Gloeosporium sp.) caused considerable mortality amongst seedlings in a Metropolitan nursery, following early autumn rain.

PIMELIA HIRSUTA.

LEAF SPOT (Cercospora sp.) was recorded for the first time on this host in the Metropolitan area.

POLYGONUM AVICULARE.

DOWNY MILDEW (Peronospora polygoni) was recorded from Leeton.

SIDA RHOMBIFOLIA.

SCLEROTINIA ROT (Sclerotinia sclerotiorum) was recorded for the first time on this host from Lisarow.

SOLANUM OPACUM.

ROOT KNOT (Heterodera marioni) was recorded for the first time on this host from a Metropolitan locality.

SONCHUS OLERACEUS.

LEAF SPOTS (Septoria sp. & Alternaria sp.) were very prevalent and caused considerable blighting during autumn.

SCLEROTINIA ROT (Sclerotinia sclerotiorum) was recorded from Carlingford and Pitt Town.

VITIS CLEMATIDEA.

BACTERIAL LEAF SPOT (Xanthomonas sp.) was recorded from North Ryde.